Remarks

The Office Action mailed December 18, 2002 has been received and reviewed. Claims 9-11, 22-23, 36-38, and 49-51 having been allowed and claims 1, 9-11, 13, 26, and 40 having been amended, the pending claims are claims 1-51. Reconsideration and withdrawal of the rejections are respectfully requested

The specification has been amended at paragraph beginning at page 13, line 32, to correct typographical and grammatical errors.

Claims 1, 9-11, 13, 26, and 40 have been amended to delete the term "intermittent." It is applicant's position that this amendment does not narrow the scope of the claims.

The applicant notes with appreciation the indication that claims 9-11, 22-23, 36-38, and 49-51 are allowed.

The 35 U.S.C. §103 Rejection

The Examiner rejected claims 1-4, 8, 12-16, 20, 21, 24-29, 33-35, 39-43, 47, and 48 under 35 U.S.C. §103(a) as being unpatentable over Ferguson (U.S. Patent No. 5,575,237) in view of Schonberg (U.S. Patent No. 4,625,728). This rejection is respectfully traversed.

The burden is on the Office to establish a *prima facie* case of obviousness of the claimed invention, and it is respectfully argued that the Office has not met this burden. The three criteria that must be met are: (i) there must be a suggestion or motivation, either in the documents themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the document or to combine document teachings; (ii) there must be a reasonable expectation of success; and (iii) the prior art document (or documents when combined) must teach or suggest all the claim limitations. MPEP § 2143.

Ferguson discloses a method of hatching eggs of avian species. The method includes

> "at least one cycle of steps (a) to (c) as follows: a) incubating the eggs in a first, baseline ambient environment . . . and then during a sex-sensitive time window of

> embryonic development, (b) altering the ambient environment to shifted conditions for a period of time effective to bias the normal phenotypic sex ratio of the embryos, without significant adverse effect on the average mortality rate, and (c) thereafter restoring the incubation conditions to or towards normal, and allowing the eggs to hatch."

Ferguson, col. 2, lines 10-23. Ferguson also states that the "alteration of the ambient environment to shifted conditions normally takes the form of a reduction in temperature of incubation." Ferguson, col. 2, lines 24-26. Ferguson does not appear to teach or suggest the alteration of any other ambient environment condition, and Ferguson does not teach or suggest exposing an egg to monochromatic light.

Much of Schonberg is directed to exposing poultry to different energy levels. According to Schonberg, exposure of poultry to near red light will "modify body weight, promote sexual development, improve efficiency of food consumption, reduce mortality caused by stress and cannibalism, and increase egg productivity." Schonberg, col. 2, lines 37-41. Schonberg, col.3, lines 4-7. Schonberg also states at column 3, lines 9-20 that

> "a light source having an illumination spectrum in the green band is used in management of embryo growth by irradiation for a controlled period of time, until an optimum embryo weight is attained, either at or before term. Alternatively, a light source providing near red radiation is employed for a controlled period of time, in order to accelerate the embryo's maturation which, in the case of poultry, results in earlier hatching. Both methods will reduce the time needed for either embryonal growth or embryonic maturation, thus resulting in considerable savings in time and money."

Schonberg does not teach or suggest exposing an egg to monochromatic light for a photoperiod comprising a light period and dark period, nor does Schonberg teach or suggest increasing a bird's weight, muscle weight, or decreasing mortality by exposing an egg to a monochromatic light.

The applicant respectfully submits that the requisite motivation to combine Ferguson with Schonberg cannot be found in either Ferguson or Schonberg. It is axiomatic that motivation to combine the two documents cannot be attributed to the combination itself, and the Office has not shown the existence in either cited document of a motivation to combine the

disclosures to produce the claimed invention. Each document is examined in the following paragraphs for the existence of the requisite motivation.

The applicant submits that a fair reading of Ferguson would certainly not lead one of skill in the art to combine the method of hatching eggs disclosed therein with the method of Schonberg. Plainly, in Ferguson there is no motivation to use Schonberg's light source. Ferguson is directed to the alteration of the normal phenotypic sex ratio of avian embryos towards an increase in males or towards an increase in females, and is not concerned with reducing the time needed for either embryonal growth or embryonic maturation.

Likewise, a person of ordinary skill would not be led by Schonberg to combine the method of Schonberg with the method of Ferguson. Schonberg discloses the management of embryo growth by irradiation, but for the purpose of reducing the time needed for either embryonal growth or embryonic maturation. Schonberg is silent regarding the alteration of temperatures during the incubation of eggs and biasing the normal phenotypic sex ratio of embryos.

Applicants submit that even if the cited documents were combined, there would be no reasonable expectation of success. Finally, even if the cited documents are combined, the combination does not teach or suggest each and every limitation of the claimed invention as required in order to establish a *prima facie* case of obviousness. Specifically, the combination does not teach or suggest exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period (independent claims 1 and 24), a method including exposing an egg to a monochromatic light such that the resulting bird has a greater weight or greater muscle weight at about 28 days after hatching compared to a bird resulting from an egg not exposed to the light (independent claims 12 and 25), or a method including exposing an egg to a monochromatic light such that the resulting bird has a lower mortality rate compared to a bird resulting from an egg not exposed to the light (independent claim 39).

"The rationale to modify or combine the prior art does not have to be expressly stated in the prior art; the rationale may be expressly or impliedly contained in the prior art or it

may be reasoned from knowledge generally available to one of ordinary skill in the art, established scientific principles, or legal precedent established by prior case law." MPEP §2144. "The initial burden is on the examiner to provide some suggestion of the desirability of doing what the inventor has done. To support the conclusion that the claimed invention is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed invention or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." MPEP §706.02(j) (emphasis added). Applicant respectfully submits that the cited documents do not expressly or implicitly suggest the claimed invention. Further, the statement "to use the light of Schonberg with the environment altering method of Ferguson would have been obvious to one skilled in the art in order to influence the embryo in other areas or for alternate characteristics" (Action at page 2) cannot be considered a convincing line of reasoning. The statement is merely conclusory, and "[b]road conclusory statements regarding the teaching of multiple references, standing alone, are not 'evidence.' " In re Dembiczak, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999).

The Examiner is respectfully requested to reconsider and withdraw the rejection of claims 1-4, 8, 12-16, 20, 21, 24-29, 33-35, 39-43, 47, and 48 under 35 U.S.C. §103(a) as being unpatentable over the cited art.

Summary

It is respectfully submitted that the pending claims 1-51 are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicant's Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for
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PATENT TRADEMARK OFFICE

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CERTIFICATE UNDER 37 CFR §1.10:
"Express Mail" mailing label number: **EV 183608355 US** Date of Deposit: **MARCH 18, 2003**
The undersigned hereby certifies that this paper is being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR §1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

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APPENDIX A - SPECIFICATION/CLAIM AMENDMENTS
INCLUDING NOTATIONS TO INDICATE CHANGES MADE
Serial No.: 10/087,617
Confirmation No. 7945
Docket No.: 293.00050101

Amendments to the following are indicated by underlining what has been added and bracketing what has been deleted.

In the Specification

The paragraph beginning at **page 13, line 32**, has been amended as follows:

Rozenboim et al. [Coleman and MacDaniel] studied the role of artificial light stimulation during embryonic development and found that in ovo photostimulation caused acceleration in embryo development and early hatch (Rozenboim et al. [Coleman and MacDaniel], *Poultry Science,* 78, 135-138 (1975); *Poultry Science*, 54, 1415-1421 (1975); and *Poultry Science*, 55, 2483-2485 (1976)). Advanced hatching was found in embryos photostimulated with white light, which appeared to be due to an increase in egg temperature (for details see Romanoff, *Avian Embryo: structural and functional development.* MacMillan, New York (1960)). In a preliminary setup we found that photostimulation of egg for 30 minutes with various wavelengths at an intensity of 0.1 W/m^2 caused an elevation in yolk temperature by 0.3°F, resulting in an early hatch of broiler chicks and turkey poults. The use of intermittent lighting described herein eliminated the early hatch associated with the increase in egg temperature. In the second experiment, although illuminated intermittently, an early hatch was detected in the white light treated birds, suggesting overheating of eggs due to better penetration of the long wavelength used by the mini-incandescent lamps. Fairchild and Christensen (*Poultry Science*, 79, 1627-31 (2000)) had shown that photostimulation of turkey eggs with incandescent lamps caused early hatch with no effect on hatchability, embryonic survival, liver or heart growth, and glycogen content. In this study, increased early post hatch mortality was detected in the white light photostimulated group suggesting that the embryonic overheating effect has a carry over impact on survival of the poults.

In the Claims

For convenience, all pending claims are shown below.

1. (AMENDED) A method for exposing an embryo to light, the method comprising exposing an egg to a monochromatic light for a [an intermittent] photoperiod comprising a light period and dark period.

2. The method of claim 1 wherein each light period and each dark period are each independently at least about 3 minutes.

3. The method of claim 1 wherein each light period and each dark period are each independently at least about 15 minutes.

4. The method of claim 1 wherein each light period comprises a period of about 3 to about 15 minutes, and wherein each dark period comprises a period of about 3 to about 15 minutes.

5. The method of claim 1 wherein the monochromatic light comprises a peak wavelength of at least about 500 nanometers (nm) to no greater than about 590 nm.

6. The method of claim 1 wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm.

7. The method of claim 1 wherein the monochromatic light has an intensity of at least about 0.001 watts/m^2 to no greater than about 0.2 watts/m^2.

8. The method of claim 1 wherein the egg is a chicken egg or a turkey egg.

9. (AMENDED) A method for exposing an embryo to light, the method comprising exposing an egg to a monochromatic light for a [an intermittent] photoperiod comprising a light period and dark period, wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm.

10. (AMENDED) A method for exposing an embryo to light, the method comprising exposing an egg to a monochromatic light for a [an intermittent] photoperiod comprising a light period and dark period, wherein each light period and each dark period are each independently at least about 3 minutes, wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm.

11. (AMENDED) A method for exposing an embryo to light, the method comprising exposing an egg to a monochromatic light for a [an intermittent] photoperiod comprising a light period and dark period, wherein each light period and each dark period are each independently at least about 3 minutes, wherein the monochromatic light comprises a peak wavelength of about 560 nm, half band +/- about 15 nm, and wherein the monochromatic light has an intensity of at least about 0.08 watts/m^2 to no greater than about 0.2 watts/m^2.

12. A method for increasing a bird's weight, the method comprising:

exposing an egg to a monochromatic light for a photoperiod; and

hatching the egg, wherein the bird that hatches from the egg has a greater weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

13. (AMENDED) The method of claim 12 wherein the photoperiod [is an intermittent photoperiod comprising] comprises a light period and a dark photoperiod.

14. The method of claim 13 wherein each light period and each dark period are each independently at least about 3 minutes.

15. The method of claim 13 wherein each light period and each dark period are each independently at least about 15 minutes.

16. The method of claim 13 wherein each light period comprises a period of about 3 to about 15 minutes, and wherein each dark period comprises a period of about 3 to about 15 minutes.

17. The method of claim 12 wherein the monochromatic light comprises a peak wavelength of at least about 500 nm to no greater than about 590 nm.

18. The method of claim 12 wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm.

19. The method of claim 12 wherein the monochromatic light has an intensity of at least about 0.001 watts/m^2 to no greater than about 0.2 watts/m^2.

20. The method of claim 12 wherein the egg is a chicken egg or a turkey egg.

21. The method of claim 12 wherein the bird that hatches from the egg is a hen.

22. A method for increasing a bird's weight, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm; and

hatching the egg, wherein the bird that hatches from the egg has a greater weight

at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

23. A method for increasing a bird's weight, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein each light period and each dark period are each independently at least about 3 minutes, and wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm; and

hatching the egg, wherein the bird that hatches from the egg has a greater weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

24. A method for increasing a bird's weight, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein each light period and each dark period are each independently at least about 3 minutes, wherein the monochromatic light comprises a peak wavelength of about 560 nm, half band +/- about 15 nm, and wherein the monochromatic light has an intensity of at least about 0.08 watts/m^2 to no greater than about 0.2 watts/m^2; and

hatching the egg, wherein the bird that hatches from the egg has a greater weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

25. A method for increasing muscle weight in a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod; and

hatching the egg, wherein the bird that hatches from the egg has greater muscle weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

26. (AMENDED) The method of claim 25 wherein the photoperiod [is an intermittent photoperiod comprising] comprises a light period and a dark photoperiod

27. The method of claim 26 wherein each light period and each dark period are each independently at least about 3 minutes.

28. The method of claim 26 wherein each light period and each dark period are each independently at least about 15 minutes.

29. The method of claim 26 wherein each light period comprises a period of about 3 to about 15 minutes, and wherein each dark period comprises a period of about 3 to about 15 minutes.

30. The method of claim 25 wherein the monochromatic light comprises a peak wavelength of at least about 500 nm to no greater than about 590 nm.

31. The method of claim 25 wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm.

32. The method of claim 25 wherein the monochromatic light has an intensity of at least about 0.001 watts/m^2 to no greater than about 0.2 watts/m^2.

33. The method of claim 25 wherein the egg is a chicken egg or a turkey egg.

34. The method of claim 25 wherein the bird that hatches from the egg is a hen.

35. The method of claim 25 wherein the muscle is breast muscle.

36. A method for increasing muscle weight in a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm; and

hatching the egg, wherein the bird that hatches from the egg has greater muscle weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

37. A method for increasing muscle weight in a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein each light period and each dark period are each independently at least about 3 minutes, and wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm; and

hatching the egg, wherein the bird that hatches from the egg has greater muscle weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

38. A method for increasing muscle weight in a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein each light period and each dark period are each independently at least about 3 minutes, wherein the monochromatic light comprises a peak wavelength of about 560 nm, half band +/- about 15 nm, and wherein the monochromatic light has an intensity of at least about 0.08 watts/m^2 to no greater than about 0.2 watts/m^2; and

hatching the egg, wherein the bird that hatches from the egg has greater muscle weight at about 28 days after hatching compared to a bird that hatches from an egg not exposed to the monochromatic light.

39. A method for decreasing a mortality rate of a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod; and

hatching the egg, wherein the mortality rate of a bird that hatches from the egg has a lower mortality rate compared to a bird that hatches from an egg not exposed to the monochromatic light.

40. (AMENDED) The method of claim 39 wherein the photoperiod [is an intermittent photoperiod comprising] comprises a light period and a dark photoperiod.

41. The method of claim 40 wherein each light period and each dark period are each independently at least about 3 minutes.

42. The method of claim 40 wherein each light period and each dark period are each independently at least about 15 minutes.

43. The method of claim 40 wherein each light period comprises a period of about 3 to about 15 minutes, and wherein each dark period comprises a period of about 3 to about 15 minutes.

44. The method of claim 39 wherein the monochromatic light comprises a peak wavelength of at least about 500 nm to no greater than about 590 nm.

45. The method of claim 39 wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm.

46. The method of claim 39 wherein the monochromatic light has an intensity of at least about 0.001 watts/m^2 to no greater than about 0.2 watts/m^2.

47. The method of claim 39 wherein the egg is a chicken egg or a turkey egg.

48. The method of claim 39 wherein the bird that hatches from the egg is a hen.

49. A method for decreasing a mortality rate of a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm; and

hatching the egg, wherein the mortality rate of a bird that hatches from the egg has a lower mortality rate compared to a bird that hatches from an egg not exposed to the monochromatic light.

50. A method for decreasing a mortality rate of a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein each light period and each dark period are each independently at least about 3 minutes, and wherein the monochromatic light comprises a peak wavelength of at least about 550 nm to no greater than about 570 nm; and

hatching the egg, wherein the mortality rate of a bird that hatches from the egg has a lower mortality rate compared to a bird that hatches from an egg not exposed to the monochromatic light.

51. A method for decreasing a mortality rate of a bird, the method comprising:

exposing an egg to a monochromatic light for a photoperiod comprising a light period and a dark period, wherein each light period and each dark period are each independently at least about 3 minutes, and wherein the monochromatic light comprises a peak wavelength of about 560 nm, half band +/- about 15 nm, and wherein the monochromatic light has an intensity of at least about 0.08 watts/m^2 to no greater than about 0.2 watts/m^2; and

hatching the egg, wherein the mortality rate of a bird that hatches from the egg has a lower mortality rate compared to a bird that hatches from an egg not exposed to the monochromatic light.